G

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,093	10/08/2003	Daniel Luch		9216

7590 10/15/2007

Daniel Luch
17161 Copper Hill Drive
Morgan Hill, CA 95037

EXAMINER	
BARTON, JEFFREY THOMAS	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
10/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/682,093	**Applicant(s)** LUCH, DANIEL
	Examiner Jeffrey T. Barton	**Art Unit** 1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on 18 July 2007 does not place the application in condition for allowance.

Status of Objections and Rejections Pending Since the Office Action of 17 April 2007

2. All previous objections and rejections are obviated by the cancellation of all previous claims.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 19-39 and 41-44 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuzuki et al. (US 5,679,176)

Regarding claim 19, Tsuzuki et al disclose in combination (Figures 3 and 4) an electrically conductive or semiconductive surface (Top of transparent conductive layer 404) and a current collector structure as claimed (All structure lying above layer 404), comprising a sheetlike substrate (301) having a first substrate surface (i.e. the bottom surface of layer 301 as shown in Figure 3); a first material (302) overlaying a portion of the first substrate surface, said first material comprising a polymer (Column 4, lines 44-64) and characterized as having a pattern (i.e. indentation pattern defined by the cell contours apparent from Figures 3 and 4); a second pattern comprising a metal, said second pattern being at least partially defined by said first pattern. (i.e. the grid pattern defined by layers 405, 406, and 407; Column 6, line 61 - Column 7, line 23); said combination characterized by having the metal in electrical communication with the conductive or semiconductive surface. (Column 6, line 61 - Column 7, line 7)

Undue cannot be given to the limitation to the metal of the second pattern being "electrodeposited", because this limitation is drawn only to the formation of a product by a specified process. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) In the instant case, the claimed structure is not distinct from that disclosed by Tsuzuki et al because there is no evidence that the structure of metals 405 or 406 (for example) is different from an electrodeposited metal.

Regarding claim 20, Tsuzuki et al disclose the conductive or semiconductive surface being the light-incident surface of a solar cell. (Column 6, line 61 - Column 7, line 7; Figures 3 and 4)

Regarding claim 21, Tsuzuki et al disclose the cell comprising a thin film semiconductor structure. (Layer 403; Column 6, lines 22-39)

Regarding claim 22, Tsuzuki et al disclose layer 403 being supported on a metal foil (i.e. thin metal layer 402; Column 6, lines 5-14)

Regarding claim 23, layer 404 of Tsuzuki et al is a transparent conductive oxide. (Column 6, lines 40-60)

Regarding claim 24, the current produced by the structure of Tsuzuki et al is a photogenerated current. (Note title, abstract, and discussions of Figures 1-6)

Regarding claim 25, the entire substrate 302 is laminated to the cells, including the upper surface of layer 404, via adhesive 302.

Regarding claim 31, the metal within (405/406/407) is deposited in a comb pattern (Column 6, lines 61-66), which reads on the instant finger/buss structure. The product-by-process limitations do not define the structure beyond that disclosed by Tsuzuki, and the limitations are therefore met. Note the citation to *In re Thorpe* above.

An alternative reading of Tsuzuki et al meets the limitations of claims 26-30 and 32-40. Combined layers 301 and 302 also read on the instant sheetlike substrate having a first surface that is the bottom surface of 302 as illustrated in Figure 3, electrode 405 reads on the first material comprising a polymer and having a first pattern (Column 6, line 61 - Column 7, line 7), and busbar 406 is a metal layer having a second pattern at least partially defined by the first layer. The citation to *In re Thorpe* above similarly applies within this reading.

Within the alternative reading, regarding claim 26, the first substrate 301/302 comprises a polymeric adhesive 302. (Column 4, lines 44-64)

Within the alternative reading, regarding claim 27, the first substrate surface is bonded to the surface of the solar cell, which includes exposed portions of layer 404. (Figures 3 and 4)

Within the alternative reading, regarding claim 28, the first substrate comprises multiple material layers. (i.e. 301 and 302)

Within the alternative reading, regarding claims 29 and 30, layer 301 is disclosed as optionally being glass (Column 5, lines 16-18), which comprises silicon.

Within the alternative reading, regarding claim 32, 405 is disclosed as being formed of a paste, which is conventionally printed. (Column 7, lines 2-7) However, undue weight cannot be given to the way in which the structure is formed, for the reasons given above relative to other product-by-process limitations.

Within the alternative reading, regarding claims 33-35, Tsuzuki et al disclose using metal power in a polymer binder as collector electrode 405, which reads on the limitations requiring a component able to assist deposition of metal, an “electrically conductive polymer”, and a “directly electroplateable resin”.

Within the alternative reading, regarding claim 36, several metals disclosed as useful for electrode 405 (e.g. Ni, Pt; Tsuzuki et al Column 7, lines 2-7) are known catalysts, suitable for initiating deposition as claimed. Note that statements of intended use do not distinguish the claims from the structure taught by Tsuzuki et al.

Within the alternative reading, regarding claims 37 and 38, the metal of busbar 406 is disclosed as being silver or copper. (Column 7, lines 11-14)

Within the alternative reading, regarding claim 39, there being no basis for determining what is a “low melting point metal based material”, silver can be considered a low-melting material, relative to copper or platinum.

Regarding claim 41, the combination of layers (301/302) read on the claimed base substrate, layer 405 as described at Column 7, lines 2-7 read on the material that can assist in deposition of metal that comprises a polymer, and busbar 406 reads on the metal overlaying a portion of the material. Note the rejection of claim 1 above concerning the other instant limitations.

Regarding claims 42 and 43, Tsuzuki et al disclose the interconnect structure being in communication with a second conductive surface (i.e. that of foil 602), which lies outside the peripheral boundary of the light incident surface. (Figure 6A-C; Example 3)

Regarding claim 44, Tsuzuki et al disclose a combination of an electrically conductive surface (Upper surface of 404 in Figure 4) and a current collector structure, the current collector structure comprising electrical traces 406 overlaying sheetlike substrate 301/302 the traces 406 comprising metal material that can assist metal deposition, the material of traces 406 having a first surface that faces the sheetlike substrate (i.e. upper surface in Figure 4) and a second surface (i.e. bottom surface in Figure 4) that is “coated” with metal 405 in that metal 405 is disposed on this surface, with the metal 405 being in electrical communication with the conductive surface.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuzuki et al in view of Sawayama et al. (US 5,428,249) Claim 39 is included in this rejection as an alternative ground of rejection, if silver cannot be considered to be a "low melting point metal based material".

Tsuzuki et al disclose devices as described above in addressing claims 19-39 and 41-44. Tsuzuki et al further teach adhering electrode 406 to collector electrode 405. (Column 7, lines 14-15)

Tsuzuki et al do not explicitly teach the second pattern comprising indium.

Sawayama et al teach adhering a conductive member (15) to the transparent conductive surface of a solar cell (11) using a low-melting solder (17), which can be an indium containing solder. (Figure 3; Column 13, line 51 - Column 14, line 9; Column 13, lines 5-47)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Tsuzuki et al by specifically using an indium-based solder to aid in adhering busbar 406 to electrode 405, as taught by Sawayama et al, because Tsuzuki et al suggest adhering busbar 406 to electrode 405, and Sawayama et al teach that indium solders are excellent in adhesion. (Column 13, lines 10-16) Within this combination, the second pattern may be considered to be 405/406/407 in the first described reading of Tsuzuki et al above, or 406 in the alternative embodiment. A coating of indium-based solder on 406 could be considered part of the second pattern in either interpretation.

Response to Arguments

8. Applicant's arguments filed on 18 July 2007 have been fully considered but they are not persuasive.

Applicant argues that the term "printed material" imparts structural limitation, in that printing produces a substantially two-dimensional form having a low profile. The Examiner agrees that the structure inherent in a printed layer is to be given weight in these product claims. However, in the interpretation of Tsuzuki et al applied in rejecting claim 32, which recites this limitation, the first material is considered to be layer 405, which is formed from paste that is conventionally printed, and is illustrated in Figure 4 in cross section as having a low profile. The Examiner must therefore maintain that no structural distinction is evident.

Applicant argues that no particular structure or methodology was taught for the collector electrode in Tsuzuki et al, other than "it is normally formed in a comb shape". As applied above, the comb-shape taught by Tsuzuki et al corresponds to the instant finger/bus structure. Furthermore, the structure shown in Figures 3 and 4 of Tsuzuki et al reads on the instant limitations, contrary to Applicant's assertion. In addition, questions of the methodology used by Tsuzuki et al versus the instant disclosure carry limited weight, in that there are no method claims pending. The claims must define distinct structure in order to be patentable.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey T. Barton whose telephone number is (571) 272-1307. The examiner can normally be reached on M-F 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

JTB
11 October 2007